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Ancient Egyptian Architecture Online

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Final Performance Report

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Introduction

The Ancient Egyptian Architecture Online project was instigated to improve the availability of and access to standardized architectural drawings of a representative selection of ancient Egyptian building types. The Aegaron project comprised two main activities. 1. The creation of detailed plans based upon published information, augmented by field checking. This part of the work was done mostly by the German Archaeological Institute in Cairo under the partner grant of the Deutsche Forschungsgemeinschaft. 2. The creation of an interface which enables users to search, compare and download drawings. This part of the work was done mostly by the University of California, Los Angeles, and financed by the National Endowment for the Humanities under grant number HG-50012-09.

Egyptologists, art historians, archaeologists and architectural historians all make extensive use of plans and elevations of ancient buildings in their classes and publications. Many of these, and especially the most recent plans are not accessible due to copyrights protection, and researchers will make use of the oldest published versions. Upon closer examination the use of these drawings proves to be problematic. When the older plans are copied or redrawn, it is often without reference to the original publication. It is rarely made explicit what the drawing actually shows: is it the state that the excavator found the building in? Is it a (partial) reconstruction? Is it a phase plan, meant to indicate the development of the building over time? Does the drawing indicate the parts of the buildings that are actually roofed, or are thought to have been roofed? The context and orientation of the buildings is often problematic also. Architects like to standardize their drawing by showing the entrance pointing at the bottom of the page. Sometimes the arrow showing the orientation of the building is missing, or the north arrow points at various degrees on different published renderings of the same building. How should an educator, creating a lesson plan, or an author looking for a plan to include in a publication, determine which of these shows the correct orientation?

A closer inspection of the representation of a particular building, for instance the Mammisi (birth temple) in Philae may illustrate this. Three plans, published in 1908, 1938 and 1980 show different locations for the entrances (note the door opening at the back of the temple in the middle and right drawing), open columns versus screen walls and different interpretations of the connection of the back part of the temple, indicative of different building phases (see figure 1).

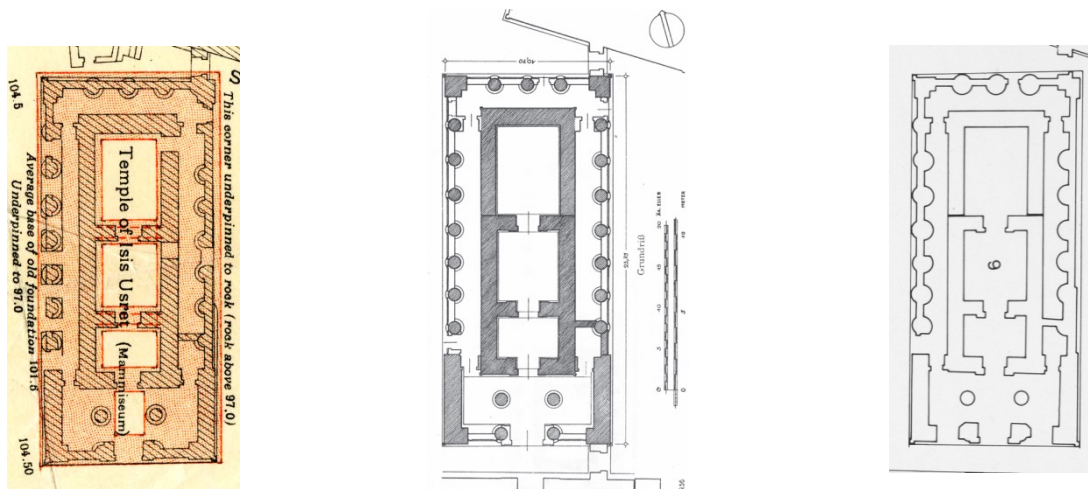


Figure 1 Three plans of the Philae Mammisi, from left to right: from Lyons 1908, Borchardt 1938 and Roccati 1980 (drawn by Giammarusti).

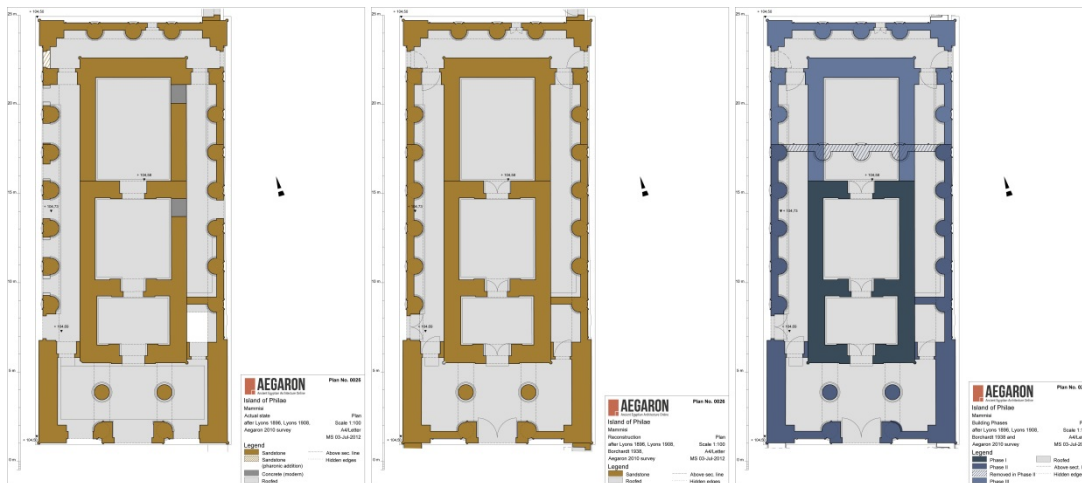


Figure 2 Three different renderings of the same building: Left the actual state as known from the earliest report (grey indicates the roofed area); in the middle the reconstruction; to the right the phase plan.

The Aegaron reconstruction plan in the middle shows that the original temple had a screen wall, which was broken through some time during the history of the temple. Research on the ground during a visit of the Aegaron team to Philae showed that the opening at the back (missing in Lyons 1908) was original. It also shows that Lyons drew the actual state of the building, while Borchardt's plan is a reconstruction. The 1980 plan is a simplified version based on the 1938 plan. For all

Aegaron drawings the team created accompanying drawing logs: lists of publications and source plans used in the Aegaron plans.

Presenting a building in its context is equally important. The Mammisi is part of an enormous temple complex that originally covered an island in the Nile (see Figure 3).

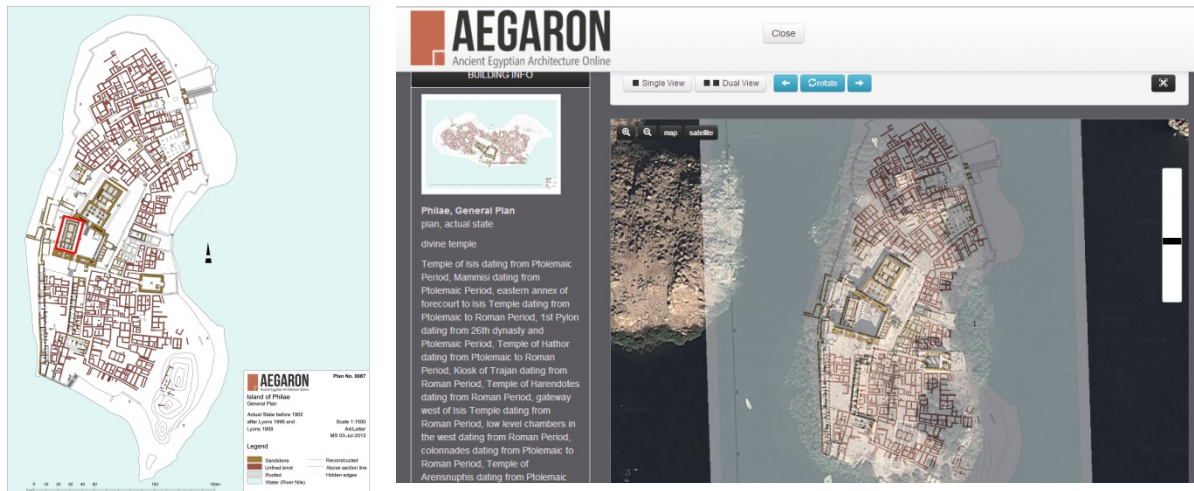


Figure 3 Geographical context: the location of the Mammisi on Philae is indicated by the red box on the plan on the left. The right shows a screen shot of the Philae plan in the web interface fading into satellite imagery. NB Philae temple was taken down and rebuilt on Agilki Island after the building of the Aswan High Dam which flooded Philae Island. The mud brick houses have not been rebuilt and the original outline of the site as shown in the Aegaron plan is slightly larger than the outline of Agilki.

Project Activities

The initial research for the project was divided between the teams in Cairo and Los Angeles. A tentative list of buildings had been drawn up as part of the grant proposal and both teams started in 2009 with library research to identify all existing published drawings pertaining to the selected buildings. Two research assistants, Bethany Simpson and Angela Susak, were hired at UCLA, while three architects and a research assistant were hired in Cairo (DFG budget): Salma Khamis, Eman Shokry, Abba Bahrawy and Martin Saehlhof. In order to diminish variant distortion both teams purchased the same large format (A3) scanner to scan all drawings. Since most of the published plans are still under copyright, the scans were organized and stored on hard drives, but cannot at present be made available through the Aegaron website. The PI's also contacted several archaeologists to enable the incorporation of the most recent and as yet unpublished drawings.

Coordination between the Cairo and LA teams was done through weekly Skype meetings between the two PI's and additional weekly meetings of the researchers, and architects. Online meetings using Skype worked well, but could not completely replace in-person meetings. Every year in Summer one or two of the Cairo team members would fly to Los Angeles, and every Fall the LA team would join the Cairo team in Egypt. The workflow and numbering systems of the many file types were worked out in the first set of meetings in Cairo in 2009. For each building all existing plans were compared. After a detailed analysis of the similarities and differences, after comparing the scaled measurements and angles, a selection was made of the best base drawing. A determination was made whether this drawing represented the actual state, reconstruction, phase plan, or a combination of these. The plan was then redrawn in AutoCAD and enhanced based on all the other available drawings, measurements and descriptions. For a considerable number of buildings the team planned field check trips, for instance the house of Ramose in Amarna (Figure 4).



Figure 4 Selma Khamis and Martin Saehlfhof field checking in Amarna. Photo by Ulrike Fauerbach.

In the summer of 2010 Ulrike Fauerbach came to Los Angeles to work with the web development team and the library on the user interface. Jennifer Dillon made the first screen designs which were tested by imagining a number of potential users ranging from the highly specialized archaeologist, looking to illustrate a particular part of a particular building, to school children, who would like to browse and explore.

Stephen Davison from the UCLA Digital Library Program and librarians Claudia Horning and Zoe Borovsky were closely involved in developing the metadata schema for the project, based on the user requirements and the first interface design. Chris Patterson was the lead programmer and coordinated the work of Sal Santa Ana (programmer at the Institute for Digital Research and Education IDRE) and Henry Chiong (programmer at the Digital Library Program). The interface was developed by IDRE, while all CAD files and PDF's were stored in the Digital Library Collection System (DLCS).

In the Summer of 2011 both Ulrike Fauerbach and Martin Saehlfhof came to Los Angeles to further develop the web interface. At this stage a set of user profiles was created with their very particular search needs, user expectations, and download preferences. The original interface designs were adapted according to the diverse needs of these different user groups.

A one year extension was requested to finalize Aegaron. Most of the testing of the web interface and final web development happened during this last year, because it appeared that testing the site functionality was best done with most of the actual content in place. The initial interface functionality tests led to a number of adaptations of the PDF's generated from the CAD files. During the development of the comparison function it was decided to georeference all drawings. This task had not been foreseen and had not been budgeted for. The UCLA library, however, took over part of the meta data entry costs, so that funds could be freed up for hiring Ryan Chen as an assistant for Yoh Kawano to assist with the georeferencing tasks. Frank Masur joined the project to finalize the programming of the web interface based on Jennifer Dillon's design.

Accomplishments

The Aegaron project accomplished the goals set in the grant proposal. A total of 185 detailed drawings have been produced representing buildings from 14 different sites and ranging from a workman's hut to palaces, temples and pyramids. The Aegaron interface provides users with the possibility to browse the existing building plans, or perform searches. The purpose is to integrate the Aegaron buildings in the time map of the UCLA Encyclopedia of Egyptology (UEE), and the time map functionality ideally should also be added to the Aegaron web site. The team was faced with the problem that searches in the UEE appeared to slow down the search functionality of Aegaron. Time and place indications are now integrated in the metadata to allow search results to appear faster.

Search functionality is designed to allow users to find buildings by geographical name, coordinates or building type. Users can search for all Aegaron plans of buildings from a certain period, during

which the building was constructed. In addition the user can choose to show the actual state of the building, a reconstruction or a phase plan.

All drawings have been georeferenced and are shown in an interface which enables the user to compare buildings: A linked zoom function allows users to look at details in, for instance, the actual state and reconstruction drawings of the same building in detail (Figure 5).

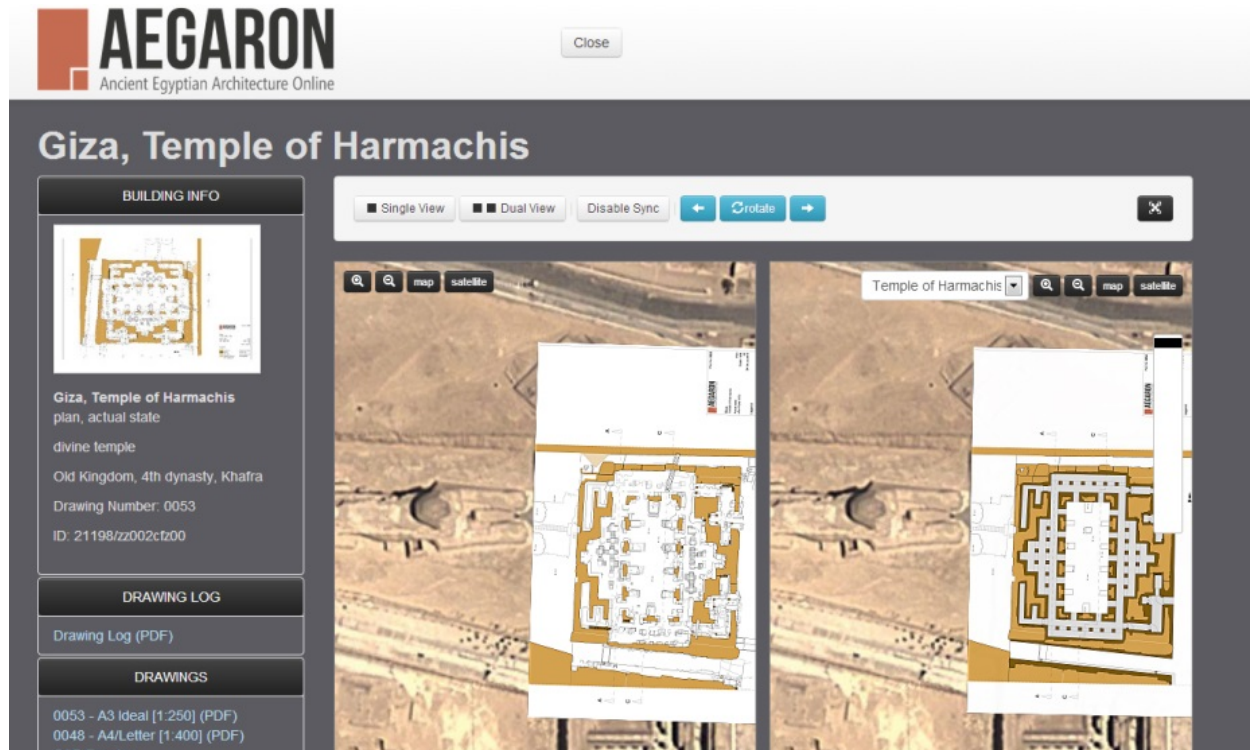


Figure 5 Comparison of the actual state (left) and reconstruction (right) of the Temple of Harmachis in Giza.

The drawings are all oriented to the north, but a rotation functionality allows the user to display the building in a way usually preferred by architects, with the entrance to the bottom of the image. Challenges are the enormous differences in scale between, for instance, a workmen's house and a pyramid. This affects decisions about showing plans to scale online, but also the print formats that are made available for free download. It has been decided that users should be able to download PDF's in several scales and printing sizes. Each drawing has an ideal print size which is linked to a scale which allows the user to see sufficient detail. For small buildings the Letter/A4 size allows a representation at a scale of 1:100. For large building complexes, such as the entire island of Philae the ideal print size is A1 (at a scale of 1:500), but alternative sizes are made available as well: A 3 (scale 1:1000) and Letter/A4 (scale 1:1500). The PDF can be used to include an image in a

publication, or extract a low resolution image to put into a PowerPoint or Prezi presentation. Experienced users can download the complete CAD file with extensive layered information, to adapt to their needs. The decision to upload PDF's rather than JPEG's or TIFF's was inspired by the fact that the former can be used to provide layered information. Tutorials on the website show how to switch information on and off in the PDF. The project is keen to encourage users to also download the drawing logs, which specify all decisions made during the drawing process, and gives credit to all artists and architects on whose work the Aegaron plans are based.

The Aegaron website and plans are brought to the attention of the public through presentations, publications and online. The launch of the website was featured in twitter. Plans from Aegaron are used in the UCLA Encyclopedia of Egyptology and several links are provided in Wikipedia (see, for instance http://en.wikipedia.org/wiki/Ancient_Egyptian_architecture and <https://en.wiki.org/wiki/Asyut>).

The Aegaron website (in beta version) was formally launched during an international conference organized at the German Archaeological Institute in Cairo on May 20, 2013. The one day conference combined an in-person meeting with a webinar in which not only UCLA participated, but also Harvard and the University of Liverpool. The conference, which attracted an audience of approximately 90 participants, featured presentations on five projects that publish information on either architecture or ancient Egypt online, such as the Theban Mapping Project (www.thebanmappingproject.com/). The Aegaron Cairo team presented the rationale and workflow of the Aegaron project. The entire UCLA team was present remotely at an early breakfast meeting in Los Angeles, joining the conference online. At the end of the conference day Willeke Wendrich outlined the functionality and features of the web-interface. This presentation was broadcasted in real time to the audience in Cairo, and was followed by an animated question and answer session that literally encompassed the US, the UK, Germany and Egypt. During the reception at the end of the one-day conference participants were invited to try out the Aegaron webpage on laptops that had been set up in the German Archaeological Institute in Cairo. Many participants took the opportunity to do so and gave feedback to the project.

Audiences

Examples of some of the audience profiles (from general to specialized):

- A high school student doing a project, who wants to find an plan of a pyramid can search for “pyramid” in the quick search box and find a PDF which she can print out, and use in a paper. This group of users will probably mostly be interested in the reconstruction drawings.
- A teacher who wants to show what an Egyptian house looks like does a quick search for “house” and finds both a high status and workmen’s house from Amarna. She uses the web interface to show the class. Most probably she will choose the reconstruction drawings.
- An undergraduate in architecture who needs to look at New Kingdom architecture. Uses the Browse function and pulls up all New Kingdom buildings. She compares the actual state and the reconstruction, as well as the phase plans.
- A graduate student of Egyptology who wants to understand the building phases of the Philae mammisi uses the browse function to go to “Philae” and compares the actual state and building phase plans.
- An archaeologist who does a study on the Philae urban structure, studies the high resolution PDF, can print out the A1 format map, or download the CAD file.
- An archaeologist who wants to create a plan of his own site using the Aegaron standards can download any of the CAD files and use these as a template. In the near future a whitepaper on the Aegaron standards will be added to the website.

Evaluation

The project proposal did not include formal evaluation plans or criteria. The launch of the beta-version of the site on May 20, 2013 saw the first intense use. The reactions of the public were very positive, even though there are still some problems with the zoom function of the site comparison, due to particular settings in Google Earth which cannot be changed. The Aegaron plans have, for instance, a much higher resolution than the satellite photographs. The “Satellite” setting allows a user to only zoom in to the level that corresponds with the resolution of the satellite photo in that particular area. The user can enlarge the Aegaron drawings much more by using the “Map” setting, but then the double view shows the satellite image at a different scale, and the Aegaron drawing seems to have disappeared, because it is programmed to a specific zoom level. These problems are currently addressed before the start of the new Aegaron-IST project in October 2013 (see below).

Continuation of the Project

Aegaron will be continued and expanded in the follow-up project *Ancient Egyptian Architecture Online – Illustrated Standardized Terminology* (Aegaron-IST), under NEH grant number HG-50046-13.

This project will start on October 1, 2013 and uses photographs and drawings of buildings to systematically illustrate Egyptian architectural terminology. The Aegaron interface will be improved and expanded to accommodate search and presentation functionality for this additional type of information. The new site will include many of the photographs taken during the first Aegaron project, which are archived, but at present not made available to the public. These photographs will be stored in the UCLA Digital Library, together with all the other Aegaron assets.

Long Term Impact

The Aegaron Project is part of a series of successful Digital Humanities projects at UCLA which involve the Center for Digital Humanities (CDH), the Institute for Digital Research and Education (IDRE) together with the Library. These projects are coordinated by a steering group and the experience and lessons learned are used to aid other faculty in developing similar initiatives. The group of faculty actively involved in Digital Humanities projects is steadily growing and has taken the initiative to start a Digital Humanities undergraduate minor and a graduate certificate program (see <http://www.cdh.ucla.edu>). The activities of the PI have led the Dean of Humanities to ask her to become the director of the Center for Digital Humanities starting July 1, 2013.

The interface developed for Aegaron can be used for other projects that need to present visual map based information. Most of all, however, Aegaron is an example of a non-traditional publication of research results with an interface that is adapted to its unique properties (layered maps and drawing logs).

Grant Products

The most important product coming out of this grant is the Aegaron website, which enables a comparison of drawings and makes the standardized drawings available to the public for free download, at <http://dai.aegaron.ucla.edu/>.

The innovative interface provides users with a large number of features specifically designed for the study of architectural drawings, such as the comparison screens, the linked zoom and rotation function and the link with Google earth to see the buildings in their geographical context.

Several academic presentations and publications have featured Aegaron:

Willeke Wendrich, *Introducing the Aegaron Project* (UCLA Cotsen Institute of Archaeology, February 2, 2013).

Willeke Wendrich, *Aegaron presentation and workshop* (UCLA Summer Digital Humanities Bootcamp, August 28, 2013).

Ulrike Fauerbach, Willeke Wendrich, Salma Khamis, Martin Sählhof, Bethany Simpson, Angela Susak, AEgArOn - Ancient Egyptian Architecture Online, in: *Digital Heritage: Third International conference, Euromed 2010, Lemessos, Cyprus, November 8-13, 2010*, Edited by Marinos Ioannides, Springerlink, u.a., Proceedings, Lecture notes in computer science, 6436, Berlin: Springer, 2010, S. 463–472 http://link.springer.com/chapter/10.1007%2F978-3-642-16873-4_37

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Ulrike Fauerbach, Martin Sählhof, Kaiserkult am Katarakt – Der Augustustempel auf Philae, in: *Bericht über die 46. Tagung für Ausgrabungswissenschaft und Bauforschung vom 12. bis 16. Mai 2010 in Konstanz*, Stuttgart 2012, pp. 65-80.

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